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⑯ **Cosmetic composition.**

⑯ A cosmetic composition includes a volatile silicone fluid, a non-volatile silicone gum and a C₁₆-C₂₂ fatty acid ester of citric acid. The composition is particularly intended for application to areas surrounding the eyes.

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The invention relates to a cosmetic composition for application to the skin, especially for treatment in areas surrounding the eyes.

Reduction or, at least, covering of facial lines and wrinkles is an important function of a cosmetic skin composition. Nowhere on the face is this function more important than around the area of the eyes. Signs of aging are particularly evident in this region.

In formulating a composition for application around the eye area, consideration must not only be given to anti-aging actives but also to aesthetics of the product. These products must be sufficiently thick to avoid running of the material into the corneum which would cause irritation. These products must stay in place even in high-heated environments. Not all types of thickening agents can be successfully employed for such products.

For instance, certain types of traditional thickening agents are quite temperature sensitive with respect to viscosity. Most important, however, is that a great many thickening agents and, even cosmetic vehicles, impart the wrong feel to the skin.

US Patent 5063057, published November 1991, discloses formulations where the vehicle and thickener may be silicone oils or gums. High viscosity silicones are known to thicken a formulation but leave a slippery residue thereby imparting a slippery rather than a tacky feel. We have found that consumers consider this undesirable. Instead, a tacky residue has been found through consumer testing to be the most aesthetically pleasing.

Another desirable aesthetic quality of a skin care product is to have a clear or transparent composition. Not all thickening agents and/or vehicles are sufficiently compatible or of the proper refractive index to achieve product clarity.

Accordingly, it is an object of the present invention to provide a skin care product that includes both volatile components and relatively non-volatile ones, with the latter conveying a slightly tacky feel to the skin upon evaporation of the lower boiling components.

Another object of the present invention is to provide a skin care product especially suitable for use in areas surrounding the eyes.

Preferred forms of the present invention provide a skin care product sufficiently thick so as to prevent the product from running once placed upon the skin.

The present invention can also provide a skin care product that is clear or transparent.

A cosmetic product is provided comprising:

- (i) from about 1 to about 90% of a volatile silicone fluid;
- (ii) from about 0.1 to about 20% by weight of a non-volatile silicone gum; and
- (iii) from about 0.5 to about 50% of a C₁₆-C₂₂ fatty acid ester of citric acid.

The present inventors have discovered that certain types of citrate esters can be formulated with silicones to provide not only a clear composition but one that leaves a slightly tacky consumer-appealing residue upon evaporation of volatile ingredients from the silicone formulation.

Thus, an essential component of the composition of the present invention is a C₁₆-C₂₂ fatty acid ester of citric acid. Illustrative of the citrate esters are triisostearyl citrate, tristearyl citrate, diisostearyl citrate, mono-isostearyl citrate, distearyl citrate, monostearyl citrate, trilinoleyl citrate, tripalmitoyl citrate and mixtures thereof. These esters may be present in amounts ranging from about 0.5 to about 50%, preferably from about 5 to about 30%, optimally between about 15 and 20% by weight of the composition.

Another important component of the present invention is a volatile silicone carrier. Particularly suitable are the polyalkyl siloxanes and the polyalkyl phenyl siloxanes. Low viscosity or volatile polydimethyl siloxanes are available as cyclomethicone in pentamer and/or tetramer form, often present as 9:1 blends. Viscosities of the volatile silicones may range from about 0.5 to less than 10 centistokes (5 x 10⁻⁷ to less than 10⁻⁵m²sec⁻¹) at 25°C. Concentrations of these silicones may range from about 1 to about 90%, preferably from about 20 to about 50% by weight.

A third component of compositions of this invention will be a non-volatile silicone gum. These gums will normally be polyalkyl siloxanes with a viscosity ranging from about 10 up to about 10,000,000 centistokes (10⁻⁵ to 10m²sec⁻¹) at 25°C. Polydimethyl siloxanes of high viscosity are available commercially under the trademarks SE 30 Gum and Vicasil from the General Electric Company. Concentrations of the silicone gum may range from about 0.1 up to about 20%, preferably from about 0.5 to about 2%, optimally about 1% by weight.

Mixtures of high and low viscosity polydimethyl siloxanes are commercially available, one such example being Dow Corning X2-1146A Fluid.

Advantageously the compositions of the present invention are substantially anhydrous, i.e. containing less than about 2% by weight preferably less than about 0.5% by weight of water.

Best results have been achieved where the ratio of silicone gum to citrate ester lies in a range from about 1:10 to about 1:100, preferably between 1:10 and 1:30 or 1:20. The range may extend from 1:15 to 1:30 or 1:20. Optimum is about 1:18.

Various types of active ingredients may be present in cosmetic compositions of the present invention. Actives are defined as skin or hair benefit agents other than emollients and other than ingredients that merely improve the physical characteristics of the composition. Although not limited to this category, general examples include sunscreens and skin anti-wrinking agents.

5 Sunscreens include those materials commonly employed to block ultraviolet light. Illustrative compounds are the derivatives of para aminobenzoic acid (PABA), cinnamate and salicylate. For example, octyl methoxycinnamate and 2-hydroxy-4-methoxy benzophenone (also known as oxybenzone) can be used. Octyl methoxycinnamate and 2-hydroxy-4-methoxy benzophenone are commercially available under the trademarks, Parsol MCX and Benzophenone-3, respectively. The exact amount of sunscreen employed in the emulsions can vary
10 depending upon the degree of protection desired from the sun's UV radiation.

15 Anti-wrinking agents are best exemplified by the 2-hydroxyalkanoic acids, prostaglandins, retinoic acids, ceramides and their derivatives. These agents may be present anywhere from about 0.00001 to about 5%, preferably from about 0.0001 to about 1%, optimally between about 0.01 and 0.2% by weight of the total composition. Most preferred of the active compounds mentioned above is 2-hydroxyoctanoic acid, retinol or retinyl
20 palmitate and pigskin or bovine-brain lipid ceramides. Further identification of ceramide structures may be found in U.S. Patent 4,950,688 (Bowser et al), herein incorporated by reference.

25 Other adjunct minor components may also be included in the cosmetic compositions. These ingredients may include preservatives, coloring agents, opacifiers and perfumes. Amounts of these materials may range anywhere from 0.001 up to 20% of the composition.

20 Compositions of the claimed invention may be packaged in a variety of different delivery systems. For instance, the systems may include aerosol spray devices, brush-applicator devices, impregnated pads, roll-on bottles and capsules. Most preferred of these systems are capsules such as those disclosed in US Patent 5063057. The preferred capsules have a round body with hollow chamber forming a major portion of the capsule, a tab forming a minor portion of the capsule, and a neck section connecting the tab with the round body.
25 Upon twisting, the neck can be broken to allow release of the cosmetic compositions of the present invention from within the chamber. For optimum aesthetics, the capsule wall is transparent thereby emphasizing the transparent nature of the composition of this invention. Walls of the capsule may be formed from any transparent material including but not limited to transparent gelatin, polyvinyl alcohol or polyvinyl pyrrolidone.

30 The following examples will more fully illustrate selected embodiments of this invention. All parts, percentages and proportions referred to herein and in the appended claims are by weight unless otherwise indicated.

EXAMPLE 1

35 A cosmetic composition illustrative of the present is described in the Table below.

	<u>Phase</u>	<u>Ingredient</u>	<u>Wt. %</u>
40	A	Silicone Fluid 344	51.974
		Silicone Fluid 345	20.000
		Silicone Gum SE-30	1.000
45	B	Tri isostearyl Citrate	18.000
		Jojoba Oil	3.000
		Caprylic/capric Triglyceride	3.000
50	C	Witch Hazel Extract	1.000
		Nettle Extract	1.000
		Filagrinol	0.500
		Phytantriol	0.200
		Vitamin E Linoleate	0.100
		Rose Hips Oil	0.100
		Cucumber extract	0.100
		1% Ceramide I in Squalene	0.025
		Vitamin K-1	0.001

55 A composition was prepared by charging a sanitized stainless steel tank provided with a propeller mixer with Silicon Fluid 344 and Silicone Fluid 345 (cyclomethicone). Silicone Gum SE-30 was then slowly added

to the stirred silicone fluid mixture. The composition was further stirred to achieve complete uniformity so that no gum pieces remained thereby forming a phase A. In a separate tank equipped with a propeller mixer, the citrate, jojoba oil and caprylic/capric triglyceride were mixed together to form a phase B solution. All remaining ingredients (phase C) in the above Table were then combined with phase B and the resultant solution agitated until uniform. Phase A was then added to the combined phases B and C followed by sufficient agitation to achieve a uniform composition.

EXAMPLE 2

10 This Example reports a series of experiments to identify additives which could impart a consumer-desired tacky afterfeel to an essentially silicone vehicle. The following base formula was employed as the vehicle in testing the various additives:

15	<u>Vehicle Component</u>	<u>Wt. %</u>
	Silicone Gum SE-30	10.0
	Silicone Fluid 345	20.0
	Silicone Fluid 344	58.5

20 A series of additives were incorporated into this base silicone formulation. Results of skin feel tests on the additive incorporated base formula are reported below.

25	<u>Additive (CTFA Name)</u>	<u>Result</u>
	Diglyceryl diisostearate	Insoluble - 2 layers formed
30	Diisostearyl fumarate	Insoluble - 2 layers formed
	Triisostearyl trimerate	Cloudy
	Maleated soybean oil	Insoluble - 2 layers formed
35	Lanolin oil	Milky
	PEG45/Dodecyl glycol copolymer	Cloudy
	Purified ester gum	Milky, thick
	Dimethicone/trimethylsiloxy silicate	Clear but insufficient afterfeel
40	Diisostearyl maleate	Clear but insufficient afterfeel
	Triisostearyl citrate	Clear, good afterfeel

45 Evident from the above Table is that only triisostearyl citrate provided both a clear transparent solution and also one that had a good afterfeel (tackiness).

EXAMPLE 3

50 A series of formulations were prepared to evaluate the effect of relative concentrations between silicone gum and triisostearyl citrate. The compositions utilized a base formula generally as outlined under Example 1 but with varying percentages of silicone gum and triisostearyl citrate. The amounts of other ingredients were as stated in Example 1, except that the quantity of silicone fluid 344 was also varied, as required, to provide the balance of the composition. Afterfeel performance experiments indicated that the best ratio of silicone gum to triisostearyl citrate was 1:18. Satisfactory results were, however, also found for these materials where the relative ratio ranged from 1:10 to at least 1:20. See Table below.

TABLE

<u>Effect of Silicone Gum to Citrate Ratio</u>				
	Sample No.	% Silicone Gum	% Triisostearyl Citrate	Performance
10	1	10.0	30.0	Rub-in time too long; too much emollient feel
15	2	10.0	20.0	Spreading into eyes; too little afterfeel
20	3	5.0	25.0	Slight draggy afterfeel
25	4	10.0	25.0	Less residual afterfeel than
30	5	15.0	25.0	Too thick
	6	5.0	15.0	Too little afterfeel
	7	1.0	18.0	Excellent afterfeel
	8	1.0	20.0	Good afterfeel
	9	1.0	10.0	Adequate afterfeel
	10	5.0	36.0	Very draggy afterfeel

35 **Claims**

1. A cosmetic product comprising:
 - (i) from 1 to 90% by weight of a volatile silicone fluid;
 - (ii) from 0.1 to 20% by weight of a non-volatile silicone gum; and
 - (iii) from 0.5 to 50% by weight of a C₁₆-C₂₂ fatty acid ester of citric acid.
2. A composition according to claim 1 wherein said composition contains less than 2% by weight of water.
3. A composition according to claim 2 wherein said composition contains less than 0.5% by weight of water.
4. A composition according to any one of claims 1 to 3 wherein said silicone gum and fatty acid ester of citric acid are present in a ratio ranging from 1:10 to 1:30.
5. A composition according to claim 4 wherein said ratio ranges from 1:10 to 1:20.
6. A composition according to any one of the preceding claims wherein said volatile silicone fluid has a viscosity ranging from 0.5 to less than 10 centistokes (5×10^{-7} to less than $1 \times 10^{-5} \text{m}^2/\text{sec}$) at 25°C.
7. A composition according to any one of the preceding claims wherein said non-volatile silicone gum has a viscosity ranging from 10 up to 10,000,000 centistokes (1×10^{-6} up to $10 \text{m}^2/\text{sec}$) at 25°C.
8. A composition according to any one of the preceding claims wherein said citrate ester is triisostearyl citrate.
9. A composition according to any one of the preceding claims wherein said composition further comprises

an active ingredient selected from sunscreens, skin anti-wrinkling agents and mixtures thereof.

10. A composition according to claim 9 comprising from 0.00001 to 5% by weight of a ceramide selected from pigskin lipid ceramides, b. vine-brain lipid ceramides and mixtures thereof.
- 5 11. A composition according to claim 9 comprising from 0.0001 to 5% by weight of 2-hydroxyoctanoic acid.
12. A composition according to claim 9 comprising from 0.00001 to 5% by weight of retinol or ester derivative thereof.
- 10 13. A composition according to any one of the preceding claims which is clear.

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